

Hitting the Ground... Monitoring

"The forest eats itself and lives forever"
~ Barbara Kingsolver



I am fortunate to often witness the everlasting processes implied by these words (one of my favorite quotes). Each day, the National Park Service Inventory and Monitoring Program vegetation field crew hikes in the lush treefern (*Cibotium glaucum*) forests of Hawai'i Volcanoes National Park (HAVO). Massive and majestic 'ōhi'a trees (*Metrosideros polymorpha*) are often covered in soft, squishy mats of bryophytes and dripping with delicate ferns. These plants are usually joined by 'olapa (*Cheirodendron trigynum*) and other native trees silently witnessing our intent movement through a maze of fibrous trunks and protective overlapping fronds. This describes 'Ōla'a wet forest, one of two areas where we are conducting intensive monitoring in the first year of the focal terrestrial plant communities protocol. The protocol provides park managers with sound data on vegetation status and trends within five community types found throughout Pacific Island Network parks, they are: wet forest, subalpine shrubland, coastal strand, mangrove, and limestone forest. Within these communities, we utilize a combination of permanent and temporary plots to gather information on both temporal (changes over time) and spatial scales.

Our hikes are long, ranging from three to seven hours each day, and are typically peppered with conversations about delicious foods, stops to add or remove clothing as the mist drifts in and out, and nerdy squeals of delight as we catch glimpses of plants like *Trematolobelia grandiflora*, *Melicope pseudoanisata* (photo at right), and

Sadleria souleyetiana. Our field plots are often in remote locations, so before we go into the field we communicate with the Inventory and Monitoring GIS specialist and park resource managers to access information about the areas, and create maps to guide us. This logistical preparation helps us to become familiar with the roads, trails, and park fences on the path to reaching a desired location, and facilitates planning to maximize efficiency in the field.



This downed tree has become a nurse log for native seedlings and ferns

Within this forest we often see large trees with exposed roots, like stilts; evidence that a nurse log has decayed

Our mission is to locate and reach certain points within the forest and establish 20 m x 50 m monitoring plots. Once a plot has been set up, we photograph, mark GIS waypoints, and draw up a map and description about the plot and how to access it. We then go about data collection.

To get an idea of which plants are present and how they are distributed in the forest vertical profile, we start by identifying and generating a list of all species present within each plot. We collect additional data along three 50 m long transects (temporary straight lines) within the plot.

To capture understory composition (plants under 2 m tall) and information on forest regeneration, we count tree seedling, small treefern, and shrub numbers to determine densities. Then we count larger trees and treeferns so that the densities of different larger species can be calculated as well. Finally, we measure canopy tree height and coarse woody debris. Combined, these measurements give us a good idea of the plant community of the area.

With so much data to gather, we are glad to have a very enthusiastic and experienced team. We work together to fine tune our methods, establish rules, and come up with solutions for situations that may be encountered in the future. So far, the vegetation field crew has been working in 'Ōla'a, but in the coming months we will be working in wet forests of the Nāhuku (formerly Thurston)/East Rift areas of HAVO. In future years, the project crew will travel to other parks in Hawaii as well as to American Samoa and the Mariana Islands; where many more exciting plant monitoring adventures await within the variety of unique plant communities this protocol aims to monitor.

—C. Yanger, Plant Biotech



An uncommon species in the citrus family, *Melicope pseudoanisata*, is named for the strong anise scent of its crushed leaves

Plant communities monitoring has begun in the wet forests of Hawai'i Volcanoes National Park

('Ōla'a, Nāhuku, & East rift zone). Next year we will monitor in the Hawai'i Volcanoes National Park subalpine areas of Mauna loa and Kahuku. In addition, Kahuku wet forest and Kaloko-Honokōhau National Historical Park coastal strand communities will be monitored. In 2012, we will tackle Haleakalā NP wet forests and subalpine zones, and Kalaupapa NHP wetlands and coastal strand communities. By 2013, we will be prepared to take on the impossibly steep wet forests of the National Park of American Samoa. Finally in 2014, we will travel to American Memorial Park to monitor the mangrove forest and War in the Pacific NHP to monitor the unique limestone forest communities.

Then we start over.



Plant monitoring team member Laura Arnold investigates an outplanted *Platydesma spathulata*, another species in the citrus family



Forest typical of 'ōla'a — view from a plot corner



Tree trunks and stumps heavily laden with mosses and native ferns are a common example of how the forest grows on top of itself



Biotech Corie Yanger measures a treefern